

Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.



Biotechnology Notes

Volume 2 • Number 8

U.S. Department of Agriculture

August 1989

Biotechnology Notes, a compilation of agency activities, news events, and upcoming meetings, is prepared for members of the U.S. Department of Agriculture's (USDA) Committee on Biotechnology in Agriculture (CBA) by USDA's Office of Agricultural Biotechnology (OAB).

INSIDE USDA

LET THERE BE LIGHT . . . AND MORE OF IT

Most students learn in high school about photosynthesis and how plant cells convert sunlight into energy. Only a few, though, are introduced to the less well-known but equally important role of light in photomorphogenesis. Photomorphogenesis is a process in which the plant responds to changes in light quantity and quality. A molecule called phytochrome has been identified as the receptor of the light signal, but how phytochrome translates the light signal into plant changes is an area that has mystified scientists for decades.

Now a researcher at the University of California at Davis, with support from the Cooperative State Research Service's (CSRS) Competitive Research Grants program, may be able to shed new "light" on the subject. J. Clark Lagarias is studying the chemical composition of the phytochrome molecule. At the same time, other researchers elsewhere in the country are delving into the molecular biology of phytochrome genes. Once both avenues have been fully explored, scientists will be in a better position to regulate the phytochrome molecule so plants may grow and thrive on cloudy days or even during seasons of limited sunlight.

OAB TO COORDINATE UPDATE ON BIOTECHNOLOGY

The Office of Technology Assessment (OTA), the scientific arm of the U.S. Congress, has asked the Office of Agricultural Biotechnology (OAB) to update information on programs and funding found in an OTA study published May 1988 entitled "U.S. Investment in Biotechnology." OAB will be working with CSRS and the Agricultural Research Service to provide the most recent program changes and funding levels for biotechnology research, in addition to projecting funding levels beyond 1989. The OTA project is being carried out in response to Congressional interest in the United States' economic competitiveness internationally in the field of biotechnology. The first report should be completed in early 1990.

AN OPINION OF THE PUBLIC'S OPINION

The first of several articles on dairy and livestock agriculture will appear in this month's issue of National Food Review. The article looks at the role public opinion and consumer acceptance have played in livestock agriculture. Written by ERS economists Fred Kuchler and John McClelland and Susan Cffutt of the Office of Management and Budget, it compares controversies over milk pasteurization, the banning of diethylstilbesterol (DES) in beef production, and accidental contamination of milk in Hawaii with the pesticide heptachlor. The authors also look at similarities and differences among these cases and the current controversy over rDNA-derived growth hormones.

OAB BRIEFS ITALIAN DELEGATION

The OAB hosted a briefing on agricultural biotechnology for nine Italian scientists now visiting the United States. The scientists were invited by Monsanto Co. to further their understanding of the issues that impact on biotechnology research and development. Daniel Jones, OAB Deputy Director, gave an overview of biotechnology at USDA; Maryln Cordle, a regulatory specialist on detail to OAB from the Food Safety and Inspection Service (FSIS), described the draft research guidelines; Marti Asner, a public affairs specialist in OAB, explained how public perception can impact on research and development and USDA's efforts to encourage public support; Pamela Love, CSRS program specialist, described the National Biological Impact Assessment Program (NBIAP); Sally McCammon, APHIS biotechnologist, explained how APHIS issues licenses and permits; and Martha Steinbock, international specialist with the Office of International Cooperation and Development, reviewed USDA's international activities in biotechnology.

The OAB briefing was the second stop of a visit that began with a tour of Monsanto Co's biotechnology facilities in St. Louis, Mo. Before returning to Italy, the group also planned to visit the headquarters of the Environmental Protection Agency (EPA) for an update on that agency's regulatory responsibilities.

BIOTECHNOLOGY AND FOOD SAFETY SYMPOSIUM

Food safety of animals produced by biotechnology, the legal aspects of food products, and the use of gene probes in food microbiology are a few of the areas that will be covered at the "Biotechnology and Food Safety" international symposium, October 10-12, at the University of Maryland, College Park, Md. Co-sponsored by the university, USDA, and DuPont, experts from the United States, France, West Germany, Israel, Great Britain, and Canada will discuss the issues and share the latest developments in food biotechnology research. Attendance is limited to the first 200 people who register. The registration fee is \$200 for the entire symposium or \$100 for one-day attendance. For more information, call either 301-454-6056 or 301-344-3338.

OAB DEPUTY PRESENTS PAPER IN SWEDEN

Daniel Jones, OAB Deputy Director, presented an invited paper on food safety to almost 500 delegates at the 10th Symposium of the World Association of Veterinary Food

Hygienists (WAVFH), July 7, in Stockholm, Sweden. Jones described food safety aspects of gene transfer in food animals, including concerns about effects of unintended physiological changes in animals on food safety and possible effects on food safety of gene products introduced primarily for veterinary purposes. Jones said a significant data base for quantitative risk assessment does not yet exist for evaluating the safety of food products prepared from transgenic animals. "Until such a data base becomes generally available," he said, "informed scientific judgment may be the primary means for anticipating potential breaches of food safety from gene transfer and resolving them."

Jones offered several points to consider in arriving at decisions based on scientific judgment. In the use of foreign genes, he cited the location of the gene within the host genome as a potential source of unintended effects. He suggested regulatory genes used may be a key consideration in assessing the food safety of transgenic animals as well as the risk to humans and animal health of antibiotic resistance genes used as marker genes. He also discussed how the United States assesses food safety and the principles underlying meat and poultry inspection statutes, food additive laws, and the legal and regulatory statutes of genetic additives in food animals.

Topics of other papers presented at the symposium included food hygiene in warmer climates, scientific bases for harmonizing meat trade, and agricultural practice and safe foods.

The WAVFH was established 20 years ago to develop a scientific base for ensuring the safety of foods prepared from animals. The organization elected Ronald Engel, international science coordinator for the Food Safety and Inspection Service, as its new president. The next symposium will be held in Bangkok, Thailand. Look for details in upcoming issues of Biotechnology Notes.

CONGRESS ASKS FOR BST UPDATE

Congress has requested USDA's Economic Research Service (ERS) to conduct a follow-up to its 1987 study "BST and the Dairy Industry: A National, Regional, and Farm-Level Analysis." The request comes as most of the technological hurdles to commercialization have been cleared and amid continuing concerns among some segments of the public and farm sector. Bovine somatotropin (BST) has now been approved for use in the Soviet Union, South Africa, and Czechoslovakia. There are no known consumer health effects of milk produced by cows treated with BST. The Food and Drug Administration has allowed milk treated in BST-tested herds to be commercially marketed.

NEWS AROUND THE COUNTRY (AND THE WORLD)

SHARING BIOTECHNOLOGY WITH DEVELOPING NATIONS

The European Economic Community Technical Center for Agricultural and Rural Cooperation and the United Nation's Food and Agriculture Organization sponsored a symposium in Luxembourg June 26-30 called "Plant Biotechnologies for Developing Countries."

The purpose of the conference was to design an action plan for the development of plant biotechnology in developing countries.

Workshops focused on identifying those problems in developing countries which may benefit from biotechnology; the infrastructure, human resource and information requirements; and proposals for programs of action. At one workshop David MacKenzie, NBIAP program director, gave an overview of the Program's information system to facilitate field test biosafety.

Many recommendations came out of the symposium, including: 1) information on advances in biotechnology worldwide should be made accessible to researchers working on problems in developing nations; 2) more developing countries should pay greater attention to the use of micropropagation techniques to assist in the eradication of diseases; 3) developing countries need to make greater use of enzyme linked immunosorbent assays to diagnose plant diseases; 4) a need exists to strengthen the infrastructure, training capabilities, and methods of disseminating information; 5) more effort should be focused on collaborative biotechnology programs between developed and developing countries; 6) appropriate biosafety guidelines should be established by developing countries with the help of international agencies and developed nations.

MORE THOUGHTS ON BIOTECH AND DEVELOPING COUNTRIES

Peter Brumby, livestock adviser with The World Bank, delivered the paper, "Agricultural Biotechnology and the World Bank: A New Challenge" at the Biotechnology Study Group meeting in Canberra, Australia, May 26. The paper presents an overview of recent trends in the application of biotechnology to agriculture, particularly in developing countries. Brumby speculates on the likely impact of biotechnology on agriculture in developing countries, concluding the potential appears substantial but that progress will be slow. He says the major bottleneck will be technology transfer. Brumby also discusses the changing role of public and private sector investments in agricultural research, ecological implications of environmental releases, patenting, and social issues. To receive a copy of the paper, call Dr. Brumby at 202-473-0351.

INTERNATIONAL SEQUENCING PROJECT

Five research laboratories in the United States and five in Europe are working on a joint project to sequence part of the *Bacillus subtilis* genome. Each laboratory has been allocated one-tenth of the *Bacillus* genome, which has 400,000 base pairs. The venture is co-directed by R. Dedonder of the Pasteur Institute in France and J.A. Hoch of the Scripps Clinic in La Jolla, Calif. Researchers around the world have been studying the *Bacillus* genome for many years and consider it a good research model. It is hoped that knowledge gained from this project will enable the scientific community to better understand how other microorganisms function.

OECD WORKING GROUP TO MEET IN CANADA

A working group of the Organization for Economic Cooperation and Development (OECD) will meet in Ottawa, Canada August 30-September 1. British scientist Roger Nourish

will chair the meeting. According to Sue Tolin, a professor of plant pathology at Virginia Polytechnic Institute and State University and a member of USDA's Agricultural Biotechnology Research Advisory Committee, as well as a special adviser to CSRS, the group will fine-tune a paper on good developmental practices for small-scale field research. An earlier draft was prepared by OECD's group of national experts on safety in biotechnology at a meeting held in Paris last June.

CALLING ALL EMPLOYERS

If you're looking to hire a few good women, or men, with expertise in biotechnology, check out the Biotechnology Center Placement Office at the University of Illinois at Urbana-Champaign. Unlike most college placement centers that pool all job hunting activities under one roof, this one is designed specifically to match recruiters with science graduates. About 60 candidates are now registered at the office. The degree breakdown, according to the placement office's brochure, shows that 40% are post-doctoral candidates, 40% are new Ph.D.'s, 15% have a M.S., and 5% a B.S. Areas of specialization include toxicology, immunology, molecular biology, molecular genetics, nutrition, protein chemistry, biochemistry, and virology. For more information about the placement service, call Catherine Connor, Placement Director, at 217-333-1695.

BRITISH REPORT FAVORS CASE-BY-CASE REVIEWS

In a report released July 6, the Royal Commission on Environmental Pollution, a British governmental body created to provide a voice on environmental issues, concludes that releases of genetically engineered organisms into the environment should be regulated on an individual basis and that each release should require a permit. "The Release of Genetically Engineered Organisms into the Environment" is available from HMSO Publications Center, P.O. Box 276, London SW8-5DT, England; or call 011-441-873-0011 or 011-441-873-9090.

IN CASE YOU WEREN'T THERE

- Ames, Iowa was the locale July 6 and 7 for an APHIS-sponsored meeting with producers of **veterinary biological products** -- diagnostic kits, vaccines, and sera used to test and treat animal diseases. The purpose of the meeting was to advise manufacturers on APHIS policy concerning amendments to the Virus-Serum-Toxin Act.

APHIS regulations requiring manufacturers to obtain a license before moving these products interstate were amended in 1985 to require a license before such products could move intrastate or be exported. The regulations go into effect January 1, 1990, unless an extension for up to one year is granted. Extensions are granted to individual manufacturers on a case-by-case basis. APHIS has granted exemptions to 57 manufacturers in 31 states.

APHIS officials explained to the more than 200 attendees how the agency would implement the amendments. They also encouraged producers to make their views on veter-

inary biological product regulation known to the agency. For more information about regulations pertaining to veterinary biological products, call David Espeseth, Deputy Director, Veterinary Biologics unit, at 301-436-8245.

- "Biotechnology in a Global Economy" was the theme of a conference sponsored by the Office of Technology Assessment, July 6-7, in Washington, D.C. Speakers from 16 foreign countries described biotech policy, funding, research and development activities, intellectual property issues, public acceptance, and regulations in these countries.

In general, the representatives of Pacific Rim countries want to expand their countries' involvement in biotechnology and offer foreign investors tax incentives and low-cost long-term loans. The policy of the British government concerning biotechnology was described as "laissez-faire" with an overlap of many programs. While public perception in Great Britain is generally favorable toward biotechnology, the opposite is true in Germany where the "Greens" hold 8.3% of the seats in Parliament, and companies have been forced to conduct their field tests in the United States. Brazil is looking for joint ventures with foreign countries and is now examining the National Institutes of Health guidelines and EPA rules concerning safety. The public perception in Australia was described as "benign" where the government funds most of research and development at universities. Although Denmark produces 40% of the world's market in insulin, that country's delegate noted that Denmark cannot support a large biotechnology industry and is looking for international cooperation in research and development activities.

- "Dealing with Field Test Regulations and Public Acceptance of Engineered Plants and Microbes" was the key topic at a workshop sponsored in Baltimore, Md. by the University of Maryland Biotechnology Institute and the Center for Public Issues in Biotechnology, July 10-12. Michael Lidsky, Deputy Director of APHIS's Biotechnology, Biologics, and Environmental Protection unit, as well as officials from EPA, Great Britain, and Canada, discussed the regulatory aspects of field testing biotechnology products. Daniel Jones, OAB Deputy Director, gave an overview of USDA's draft research guidelines and explained how they provide a scientific basis for assessing the risk of field experiments. Other attendees discussed public perception and acceptance of biotechnology, the growth of public interest, risk communication, and the role of the mass media. For more information about the workshop or the Maryland Biotechnology Institute, call Dr. Morris Levin, senior staff scientist, at 301-455-3763.

- On July 14, Alvin Young, Director of OAB, kicked off a seminar series on biotechnology sponsored by ERS's Resources and Technology Division. Speaking on "Challenges of Agricultural Biotechnology for USDA," Young said the new technology will affect nearly all aspects of agriculture from the research stage to commercialization. Many of the benefits focus on the ability to make alternate choices that will avoid the use of chemicals in the environment and water. He said the "promise" of biotechnology rests heavily on the public's understanding of and confidence in biotechnology-produced products. He said the degree of public acceptance for some scientific advances is often linked to scientific literacy, and that more should be done to strengthen science programs in high schools and colleges.

Young outlined major thrusts for the next fiscal year, including a plant genome mapping project. He said there continues to be an ongoing need for more research

using an environmental risk assessment approach. He stressed policies should encourage the transfer of technology to the private sector and the need for the United States to continue to be internationally competitive in the biotechnology arena. When asked to suggest topics that could benefit from more economic analysis, Young recommended studies that focus on food safety issues, the use of pesticides, agricultural waste and waste management, and patenting.

● Representatives from the United States and the European Community (EC) met at the Department of State, July 13, to review and discuss U.S. positions for this year's bilateral consultations on the environment with the Commission of the European Communities. The meeting focused on biotechnology and environmental issues associated with field testing genetically modified organisms. Officials from EPA and APHIS discussed methodologies, genetic transfer, and classifications of organisms. OAB Director Alvin Young gave an overview of several USDA initiatives, including the guidelines for researchers as well as the handbook for field testing. After the conference, three of the four EC delegates visited OAB and were further briefed by David MacKenzie on the NBIAP effort.

● "An Overview of Biotechnology Environmental Release Issues" was the topic at a July 20 meeting in Rockville, Md., of the **Montgomery County, Md's Hi-Tech Council**, a consortium of local businesses, laboratories, colleges and universities that serves to educate the general population on technology issues. The guest speaker, Edward Korwek, is both a lawyer and a scientist and a member of USDA's Agricultural Biotechnology Research Advisory Committee. Korwek discussed some of the challenges facing those Federal agencies involved in biotechnology regulation, such as coming to a consensus on the meaning of "biotechnology", "rDNA", and "environmental release." Korwek also discussed the regulatory framework and the scientific and legal "triggers" that move a product from the research stage to field testing and commercial development.

NEW PUBLICATIONS

● The Bureau of National Affairs Inc., a private publisher of specialized reports, now has available the following reports on biotechnology:

"Biotechnology Patents: A Business Manager's Legal Guide"

"U.S. Biotechnology: A Legislative and Regulatory Roadmap"

"The Biotech Business: Financial Outlook and Analysis"

"Biotechnology Law for the 1990's: Analysis and Perspective"

All four reports are \$250 if ordered before August 1, 1989, or \$380 after that date. Individual reports are \$95 each. To order, call 1-800-372-1033.

● Nucleotide Analogues as Antiviral Agents. Edited by John C. Martin. August 1989. Published by the American Chemical Society. ACS Symposium Series No. 401. \$44.95. To order, call 1-800-ACS-5558.

● Metal-DNA Chemistry. Edited by Thomas D. Tullius. August 1989. Published by the American Chemical Society. ACS Symposium Series No. 402. \$49.95. To order, call 1-800-ACS-5558.

● Plant Cell Wall Polymers. Edited by Norman Lewis and Michael Paice. Published by the American Chemical Society. ACS Symposium Series No. 399. \$119.95. To order, call 1-800-ACS-5558.

UPCOMING MEETINGS

Aug. 6-19: Advanced Course in Plant Tissue Culture and Plant Transformation. University of Guelph, Guelph, Ontario. Sponsored by Monsanto Canada. For details, call 519-824-4120 ext. 8773.

Aug. 13-18: The 1989 Annual Meeting of the Society for Industrial Microbiology. Seattle, Wash. For details, call the Society at 703-941-5373.

Aug. 20-24: American Phytopathological Society Annual Meeting. Richmond, Va. For details, call 612-454-7250.

Aug. 20-25: New Technology in Biotechnology: International Exhibition, held with the 11th International Congress, International Society of Developmental Biologists. Utrecht, The Netherlands. For details, call Alex Curtis at 01-836-6633 in London, England.

Aug. 21-23: Biotechnology Markets in ASEAN. Perth, Australia. For details, write to Biotechnology Programme, Murdoch University, 6150 Perth, Western Australia.

Aug. 21-23: Horticultural Biotechnology Symposium. University of California, Davis, Calif. For details, call 916-753-2116.

Aug. 25: The National Research Council briefing on a new report entitled "The Ecology of Plant-Associated Microorganisms." Washington, D.C. For more information, call 202-334-2233.

Sept. 13-15: Paine Webber Biotechnology Conference: Biopharmaceuticals 1989. San Diego, Calif. For details, call 212-477-9600.

Sept. 14-17: 5th International Fallen Leaf Lake Conference, Molecular Biology of Plant Pathogenic Bacteria, South Lake Tahoe, Calif. Call Mrs. Valinda Stagner at 916-752-0300.

Biotechnology Notes is written and edited by Marti Asner, a public affairs specialist in USDA's Office of Agricultural Biotechnology. Suggestions for items to include in future issues are always appreciated and may be sent to USDA/OAB, Room 321-A, Administration Bldg., 14th and Independence Ave., S.W. 20250; or call 202-447-9165.